

Mathematics Makes Connections

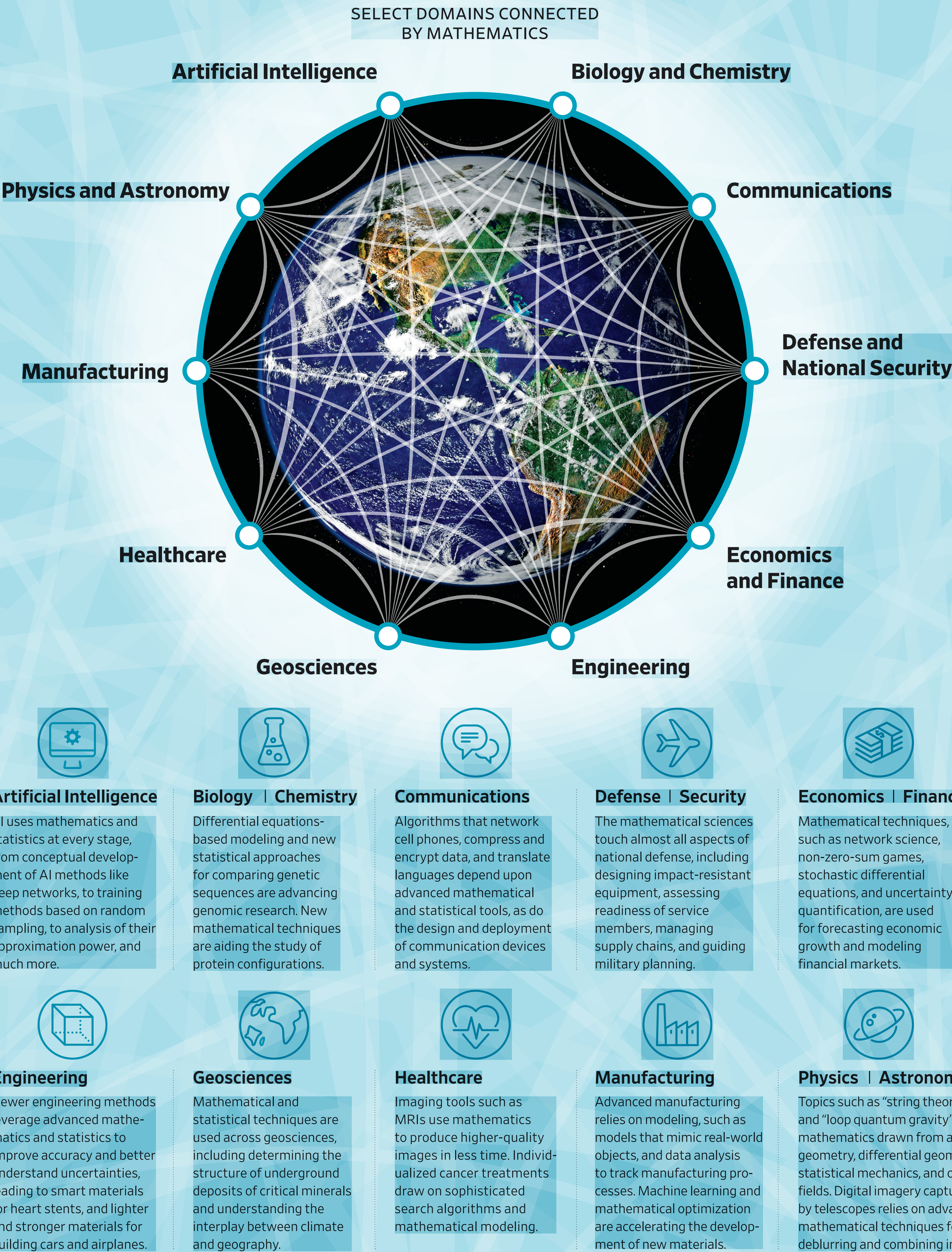
You probably realize that mathematics underpins a wide range of your daily activities from streaming movies and paying bills online, to GPS navigation, to predicting the weather, to designing more aerodynamic and gas efficient cars.

However, you probably don't realize that the mathematics of streaming movies is closely related to that for GPS navigation, or that the equations for predicting weather have connections to the equations of combustion in gasoline engines. Mathematics is a bridge between many different disciplines.

Mathematical abstraction, where a real-world phenomenon or behavior is defined by its core characteristics and rules,

can help us see how a biological system follows the same patterns as the stock market or how the process of designing a new material is similar to the approach to building a bridge. This crosscutting applicability is possible because mathematicians frame problems in a generalizable way.

Advancing theoretical foundations in the mathematical sciences leads to impactful applications, but that is often not the whole story. Advances in practical applications can lead to novel theories, which give rise to even more impactful applications. And the cycle continues from there.



Source: Image of Earth created by Reto Stöckli, Nazmi El Saleous, and Marit Jentoft-Nilsen, NASA GSFC.